Studies of the Status of Central Business District Area (CBD) in Yangon, Myanmar

Lin Zaw¹, Theingi Shwe², Maung Hlaing³

¹Researcher, Master of Architecture, Department of Architecture, Yangon Technological University, Insein, Yangon, Myanmar
²Assistant Professor, Department of Architecture, Yangon Technological University, Insein, Yangon, Myanmar
³Professor, Head of Department, Department of Architecture, Yangon Technological University, Insein, Yangon, Myanmar

Abstract — Commercial center is an area which used for commercial activities. These activities include the buying and selling of goods and services. Good secondary shopping centers come in all sizes and can operate at the neighborhood, district and sub-regional level. A high quality retail tenant mix and good car parking and access are the key characteristics of good secondary centers, although the size and spending power of the catchment population and the location of the scheme within its urban environment are also important.

Yagon was expanded to the northern part of the city in recent century. At 1990, the shape of Yangon was the elongated shape with the distance of about 15 miles from north to south and 6 miles from east to west. After that the eastern part and the western part of Yangon were redeveloped and the shape of Yangon was changed from elongated shape to circular shape.

Although the shape of Yangon was changed, the CBD of Yangon still remains in southern portion of city. There were special shops, shopping centers, cinemas and high density of population in present CBD. As the high density of population, shopping centers and other business buildings are closely located in CBD, low speed of vehicles and traffic congestion occur every day.

If Secondary Commercial Center will be developed not only the problems of primary CBD must be referred but also the foreign investments can be made in this area. The studies of this paper reveal the status of the areas of CBD in Yangon. The study aims to reduce the congestion of current CBD and to decentralize the new economic zone with suitable location.

Keywords — Commercial Center, Central Business District (CBD), Sub-center, Floor Area Ratio (FAR), Traffic Congestion, Population Density, Urbanization, Building Coverage Ratio (BCR).

I. INTRODUCTION

The density of population in Yangon Central Business District is 90,000 per square mile. About 2 million work in Yangon; 40 per cent of them commute every day from their homes to the business district. Since there are also large amount of population living in this CBD, together with the people who come to this area for work and for business, the area is very much overcrowded.

Since there are many buildings with historical value in this area, it is not suitable to substitute the buildings with high-rises; moreover the additional construction would even attract more traffic and interaction of people, and would increase the congestion in this area. To lessen the traffic congestion and general lessening of density is the emergence of the second economic zone that can compete with the central economic zone of the city.

II. APPROACH TO SECONDARY COMMERCIAL CENTER (SUB CENTER)

A secondary center, especially a commercial or shopping area located away from the main business sector of a city [3]. Metropolitan areas are now characterized by decentralized patterns of employment rather than by monocentric urban structure. Sub-centers are generated when the congestion effects are high and agglomerative forces are strong.

Among various ways to define sub centers, McDonald (1987)'s that employment, not population is the key to understanding the formation of urban centers; and that a center is best identified by finding a zone for which gross employment density exceeds that of its neighbors.

A center is therefore defined as a continuous set of zones, each with employment density above some cutoff D, that together have at least E total employment and for which all the immediately adjacent zones outside the sub center have density below D. Density cut-off D is chosen to be 10 employees per acre, minimum total employee E is chosen to be 10,000 [2].
III. LITERATURE REVIEW

A. Important measures for secondary commercial center

The following important measurements are taken into consideration in the secondary commercial center.

1. Zoning regulations
2. Density of Population
3. Floor Area Ratio
4. Building Coverage Ratio
5. Building height

B. Zoning Regulations

Commercial areas in a city can take up about 5% of a city’s land. It is used for commercial activities. These activities include the buying and selling of goods and services in retail businesses, wholesale buying and selling, financial establishments, and a wide variety of services that are broadly classified as "business". Even though these commercial activities use only a small amount of land, they are extremely important to a community’s economy. They provide jobs and bring money into the community.

A commercial area is real estate intended for use by for-profit businesses, such as office complexes, shopping malls, service stations and restaurants. It may be purchased outright by a developer for future projects or leased through a real estate broker. This type of property falls somewhere between residential and industrial property. Practically every incorporated city uses a zoning system to regulate the use of property within its jurisdiction. In order to grant permission to build a new office complex or other profit-making business, the city government must determine that the chosen area is indeed commercial area. The zones which separate commercial, industrial, and residential area are clearly marked on city maps. If the proposed business is clearly in an area zoned for commercial use, then the city will allow the sale to proceed for the stated use.

Zoning is a device of land-use planning used by local governments in most developed countries. The word is derived from the practice of designating permitted uses of land based on mapped zones which separate one set of land uses from another [4].

Zoning may be use-based (regulating the uses to which land may be put, also called functional zoning), or it may regulate building height, lot coverage (density), and similar characteristics, or some combination of these. Similar urban planning methods have dictated the use of various areas for particular purposes in many cities from ancient times.

1) Scope

Theoretically, the primary purpose of zoning is to segregate uses that are thought to be incompatible. In practice, zoning is used to prevent new development from interfering with existing residents or businesses and to preserve the "character" of a community. Zoning is commonly controlled by local governments such as counties or municipalities, though the nature of the zoning regime may be determined or limited by state or national planning authorities or through enabling legislation. Zoning may include regulation of the kinds of activities which will be acceptable on particular lots (such as open space, residential, agricultural, commercial or industrial), the densities at which those activities can be performed (from low-density housing such as single family homes to high-density such as high-rise apartment buildings), the height of buildings, the amount of space structures may occupy, the location of a building on the lot (setbacks), the proportions of the types of space on a lot, such as how much landscaped space, impervious surface, traffic lanes, and whether or not parking is provided. In Germany, zoning usually includes building design, very specific green space and compensation regulations. It is always similar the details of how individual planning systems incorporate zoning into their regulatory regimes varies though the intention. Most zoning systems have a procedure for granting variances (exceptions to the zoning rules), usually because of some perceived hardship caused by the particular nature of the property in question.

2) Zoning Laws

Cities often use zoning laws to prevent conflicts between residential homeowners and businesses. Land designated as a commercial area is rarely located in the middle of residential zones. City planners encourage businesses to congregate along busier streets and central downtown areas. This helps to keep traffic to these sites manageable. Some areas of the city may be designated for 'mixed usage', which means some commercial areas may be used for residential purposes. A quaint downtown shopping area with apartments would be an example of mixed usage. Commercial areas definition may include industrial usage as well, although zoning laws still regulate the level of industry permitted. Heavier industries often purchase property on the fringes of cities or in unincorporated areas. Some commercial zones in the city do allow for light industrial usage, usually smaller factories with minimal emissions and transportation needs. Some examples of commercial area buildings include the following:
D. Floor Area Ratio (FAR)

Floor area ratio (FAR) means the total square feet of a building divided by the total square feet of the lot the building is located on. FAR is used by local governments in zoning codes. Higher FARs tend to indicate more urban (dense) construction.

Buildings of varying numbers of stories can have the same FAR, because the FAR counts the total floor area of a building, not just the building’s footprint. On a 4,000 square-foot lot, a 1,000 square-foot, one-story building would have the same FAR (0.25) as a two-story building where each floor was 500 square feet.

FAR is defined as a concept used in development control which imposes a floor area limitation on the total size of a building without dictating either its height or bulk. Its purpose is to put an upper limit on the amount of development permitted in a particular area so that the existing or intended public infrastructures and utilities would not be strained or over-burdened. One of the main advantages of the regulation is that it gives maximum freedom and flexibility to design the building in the most economical manner without dictating its shape.

The FAR expresses the mathematical relation between volume of building and size of land. FAR is the more adequate method than any other one in calculating infrastructure capacity or building mass and evaluating an impact on living conditions.

Although in current zoning ordinances FAR refer to net residential area, figures for FAR are given here in relation to gross residential site areas (including land for streets), because, from the point of view of spacing buildings for sunlight and daylight penetration, it does not make any difference whether streets occupy some of the intervening open spaces.

For FAR calculations for this research, gross site areas including land for streets are considered. Base on FAR, greater flexibility can be got in building design than most other development control standards. It can facilitate various building design options for a given site. Basically it can be used to help a Planning Authority in the control of the intensity of development in a given area or a particular plot of land. The FAR for any given area or piece of land would depend on the types of development and their locations, where the permitted heights of buildings are not specified (either in the number of storey or absolute height). These ratios change depending on the zoning district and lot area. The actual FAR for each zone or site of land would be individually specified by the Authority [7].
A build-out analysis can include residential dwelling units and/or commercial or mixed-use buildings. Although the build-out concept is the same, the way density is specified for commercial buildings is often different from how it is specified for residential buildings. Residential densities are usually given in terms of “dwelling units (DU) per area,” with units like DU/acre, DU/parcel, or minimum lot size (i.e., acre/DU). Commercial densities, on the other hand, are often specified in terms of “building area per lot area,” with the most common unit being “floor area ratio” or FAR.

FAR is the ratio between the total floor space in a building (including all stories) and the area of the land it is built on. It is calculated by dividing the total floor area of all buildings or structures on a lot by the total area of the lot. Some example FAR estimates:

- A building containing 20,000 square feet of floor area on a zoning lot of 10,000 square feet has a FAR of 2.0.
- A one-story building that covers an entire lot has an FAR of 1.0.
- A one-story building that covers ½ of a lot has a FAR of 0.5.
- A typical suburban mall would have a FAR of 0.25.
- A high-use office may have a FAR of over 10.0 [8].

E. Building Coverage Ratio

As part of the municipal office’s urban zoning regulations to protect against fires, wind funneling and sunlight rights etc., when buildings are constructed, they are subject to land and floor size ratios. These are called: 1) Building Coverage Ratio, and 2) Floor Area Ratio.

The Building Coverage Ratio is the size of the constructed buildings floor plate (e.g., first floor total area) as compared to the total size of the plot of land. For example if the plot of land is 100sqm and the Building Coverage Ratio is 60%, then the first floor constructed building can be up 60sqm.

The Building Coverage Ratio and the Floor-Area Ratio are dependent on the Land Use Zoning for the district. As a general rule, city centers have a higher Floor-Area-Ratio as compared to outer lying residential areas [9].

F. Building Height

In Development Control Standards Manual (Sarawak) (1998), it is mentioned that:

1. The maximum permitted height of a building is equivalent to twice the distance from the building to the plot boundary.
2. When any pairs of buildings are considered together the total height of the two buildings should not exceed twice the distance between them.
3. Depending on detailed design it may be possible for two neighboring tall blocks of buildings to be closer than the required minimum standards, for example Central Business District.

In any case, where variations from the standards are required, advice on such proposals with respect to more complex technical standards should be sought from a professional Town Planner [10].

IV. STUDIES ON CURRENT CONDITION IN YANGON

A. Urban Structure Overview

As the future urban area of the Yangon, total 39 townships, which are consisted of 33 townships under YCDC’s jurisdiction and parts of six (6) periphery townships, are set as the study area which has an area of approximately 1,500 km² as shown in figure-1. In 2002, Yangon has an urbanized area which expands with an area of approximately 505 km².

Looking at an overall spatial structure of the Yangon as shown in figure, urbanization of Yangon tends to have expanded northwards and eastwards rather than southwards and westwards. Currently, approximately the area in the radius of 15-20 km from the CBD has been urbanized except in the south and west. The areas along the major roads have expanded beyond the radius of 20 km, especially along the main roads such as No.4, No.1, and No.3 Main Roads.

Considering the urbanization trend, existence of the rivers must be focal constraints for buffering, and crossing bridge shall play more or less a trigger for urbanization. In Yangon, there are six (6) main rivers or creeks which affect urbanization trend, namely the Yangon River, Twante Canal, Pan Hlaing River, Hlaing River, Nga Moeyek Creek, and Bago River, (clockwise order). Urbanized area of Dala Township (South) and Twan Tay Township (West) are still small size in spite of ; proximity from the city center, because there is only one bridge respectively to go those townships from the city center with a circular way via northwest, Hlaing Tharyar Township. Urban transport network of Greater Yangon is developed mainly to form radius roads [10] [11].

B. Typical Land Use of Yangon

1) CBD

CBD has been densely built-up with medium height buildings for houses and shops with regularly-structured urban grid pattern made in British colonial period. In general, there is hardly any vacant space which is available for any new development except in some of the ex-government buildings [10].

The urbanized area was originally developed around Shwe Dagon Pagoda and along the Yangon River areas which still perform as the city center of Yangon today, namely CBD (Central Business District) with high density of houses and shops. Urban central functions including administration, banking, business and commerce are located in the CBD. It is likely that this current status does and will cause serious urban issues such as traffic jams, despite some urban functions, especially shopping centers, tend to be transferred from CBD to outskirts.

2) Inner Urban

Currently, inner urban areas have also been built-up with medium height shops and houses along roads and relatively low detached houses inside city block.
Green space seems to be much more remained than one in CBD. Population density of these areas is also lower than one of CBD.

3) Suburbs
Currently, suburbs are the frontage of urbanization, where a number of housing developments are occurring to accommodate high population growth. The entire area may be summed up as mixed development where some areas are developed while others are still undeveloped. Population density is not yet so high in the suburbs.

V. STUDIES ON EXISTING CONDITION OF YANGON CBD

1) Location and Area of CBD
The area of Yangon City is nearly 3 square mile and which has seven townships. They are Lanmadaw, Lathar, Pabeden, Kyauktadar, Botahaung, Pazundaung and Seikkan. According to studies about commercial facilities within CBD areas are divided by four sectors. They are -

- Service Sector
  - Modern Retail Shop
  - Traditional Market
  - Short House or Street Stores.

In service sector, there are many companies and business offices, banks, hotels and motels, restaurants, parks, cinema, hospital and medical clinic and other services. In modern retail shops, they have many shopping malls, shopping complex, convenience stores and supermarket. In traditional market, it has many public markets. In short house or street stores, they have electronic stores, book stores, mobile shops, furniture stores, other stores.

Commercial floor area of Lanmadaw Township is 46.2 acres. There are many numbers of commercial buildings in this township. In this area, it has 45 numbers of service sector, 1320 numbers of shop houses or street stores, 2 numbers of retail shops and 2 numbers of traditional markets.

In Latha Township which has 22.2 acres of commercial floor area. In this area which has 2133 numbers of shop houses or street stores such as electronic stores, jewellery stores and many others stores. This area also has 40 numbers of service sector such as banks, cinema, restaurant, beauty salon, etc., and 4 numbers of modern retail shops such as Orange Supermarket, Sein Gay Har Shopping Center and others, 4 numbers of traditional market such as Theihgyi Market, Than Market and Central City Plaza.

In Pabedan Township which has 52 acres of commercial floor area. In this area has 4583 numbers of shop houses or street stores such as book stores, electronic stores and others, 74 numbers of services sector such as medical center, bank, cinema, business office and others. And then, 5 numbers of retail shops such as FMI Shopping Center, Super One Sales Center and convenience stores, 4 numbers of traditional market such as Bogyoke Aung San Market and New Bogyoke Market.

In Kyauktada Township which has 12.8 acres of commercial floor area. In this area which has 469 numbers of shop house or street stores such as Confectioneries, furniture stores, jewellery art galleries, mobile shops, electronic stores and others. And then, 144 numbers of services sector such as bank, cinema, hotel, photos and video studio, business office and 9 numbers of modern retail shops.

In Botahtaung Township which has 28.6 acres of commercial area. In this area which has 544 numbers of shop house or street stores such as book shops, aluminum shop and 54 numbers of service sector such as business office, bank, and cinema. And then, 2 numbers of modern retail shop such as City Mart and Royal Mart Supermarket, 2 numbers of traditional market such as Bogalay Market and New May Yu Market.
In Pazaundaung Township which has 23 acres of commercial area. In this area has 305 numbers of shop house or street stores such as electronic stores and mobile shops, 22 numbers of service sectors such as restaurant, bank, cinema and other services, 2 traditional markets such as Pazaundaung Market and Ye Gyaw Market.

2) Traffic Condition

The road networks in CBD area are connected by this way. The main roads, Pyay road, Insein road, Kaga-Aye Pagoda Road, Waizanyantar Road, etc. are connected between Northern and Southern Area. Parami Road is used for connection between Eastern and Western Area. The roads in the CBD were laid out by the British Colonial administration in the 1850 on a grid pattern with the heart of the System.

The major east-west links;
- Bogyoke Aung San Street Northern side of the central area runs to the east;
- Anawrahta Street to the west;
- Mahabandoola Street to the east;
- Merchant Road to the west;
- Strand Road allows for two ways traffic flow.

The major north-south links;
- Shwe Dagon and Sule Pagoda Road, Pansotan and Bo Aung Kyaw Street and Thein Phu Road are provided for two-way traffic movement.

3) Traffic Volume in Central Area

Traffic was divided into three categories, Public transport vehicles, private cars and freight transport vehicles. In CBD, especially some of the entry points to the CBD are high. The traffic volume on the junction of Bogyoke Road and Shwedagon Pagoda Road was 2600 Vph. The intersection of Sule Pagoda Road and Boygoke Road was nearly 3000 Vph. On Anawyahtar road at Sherdagon Pogada Road was 3600 Vph and on Anawyahtar road at Sule Pagoda road was 3200 Vph and on Mahar Bandoola road at Sule Pagoda was 2400 Vph.

4) Bus Routing in CBD Area

Route from all directions must use Anawrahtar and Merchant Road for east to west and Mahabandoola Road for west to east travel and some bus route use Bogyoke Aung San Road.

VI. EXISTING OVERVIEW OF YANGON CBD

As mentioned above in accordance with the developments of Yangon the peoples are living densely between Canal Street and Bogyoke Street. That area are in the southern part of Yangon and had become a principal economic zone where the congregation of markets, shops that sell special goods, super markets and cinemas etc., are assembled. That area is only about 4 square mile wide and is only 1 per cent of Yangon area. But in the year 2011 as the population is nearly 250, 000 and about 5 % of Yangon population is living there. The density of the floor area constructed at that CBD is only about 2.5 per cent, so it is only 0.5 per cent of the whole area of Yangon. (Density of the floor area means total floor area / total land area).

Currently urban central functions including administration, banking, business and commerce are located in CBD with high density of houses and shops. The population density of CBD is a strikingly high value of 365.5 persons/ha, therefore living environment of CBD should be improved more than present level, especially sewerage, transportation and car parking, and other urban infrastructures.

More than four (4) million people from the suburb of Yangon city commute daily to the central downtown business area (CBD) for various reasons. At present, there are five (5) modes of transport such as the bus, state-owned circular railway (operated by Myanmar Railways (MR)), state riverine crafts (operated by Inland Water Transport), taxi and the private automobile. The bus system in particular dominates travel modes in the city, whereas the train only accounts for a small segment of preferred transport mode use because of its inconvenience. According to these studies 84 % of all travel is by bus, while only 3 % is by railway and 6 % by private car.
On the working day the peoples that come to CBD for the job, peoples living there and those who come for sales could reach about 500,000. Many vehicles from Yangon City come there for various reasons there are slowing of traffic problem and traffic congestion problem have emerged if there is a fire broking out in that area many human lives and immense loss of property is to be lost. The CBD has mixed land-use, people live on the upper floors and lower floors are mostly occupied for commercial functions. The origin of the problems that emerged in the economic zone of Yangon is the density of population and abundance of economic enterprises.

The major problems of these places are the vehicle accidents and traffic blockages have occurred because of the peoples who come to the market place, slow moving vehicles and the vendors at the sides of the roads. Principally a detail study about these places are to be observed and places for the convenience of the vehicles and parking places for these vehicles are needed to be implemented. Therefore, when the Second Economic Zone as mentioned before has appeared the buildings that are performing as the economic buildings could be lessened.

VII. CONCLUSION

Yangon city in 2012 has around 5 million populations and has an area of 306 sq. miles (790 sq. km). The population of the city is increasing with the rate of 2% per year, which means the city’s population is growing with about 100 000 people annually. The city has grown rapidly and new suburban satellite townships have been developed to accommodate the increasing population and resettle inhabitants from the congested inner area. Although the city boundary has been extended, the CBD remains the same at the southernmost part of the city, which is bordered by Yangon River. All important public buildings, commercial and trading centers, markets and shopping centers, even warehouses remain in CBD. So that most of the traffic flows are concentrating into the CBD on the limited number of radial roads. Since there are also large amount of population living in this CBD, together with the people who come to this area for work and for business, the area is very much overcrowded.

Since there are many buildings with historical value in this area, it is not suitable to substitute the buildings with high-rises; moreover the additional construction would even attract more traffic and interaction of people, and would increase the congestion in this area.

To lessen the traffic congestion and general lessening of density is the emergence of the second economic zone that can compete with the central economic zone of the city. The best solution is to develop another second economic zone to reduce the significance of the present CBD; this may not reduce the densities as well the activities in the present CBD in absolute terms but it would be in relative terms. The second economic zone or other similar system should be planned within the framework of structure plan, which this paper recommends to launch as soon as possible.

REFERENCES

[1] “WHAT MAKES A GOOD SECONDARY SHOPPING CENTRE?” By Neville Moss, Head of EMEA Retail Research and Albert Hoogland, Head of EMEA Shopping Centre Management.

[2] “Sub centers in the Los Angeles Region”, By Genevieve Giuliani (School of Urban and Regional Planning, University of Southern California, Los Angeles, CA 90089, USA), Kenneth A. Small (Department of Economics, University of California, Irvine, CA 92717, USA).


[8] Understanding Floor Area Ratio (FAR), Scenario 360 Help – Version 4.1


[11] Survey Data from Urban Planning Department, Yangon City Development Committee (YCDC).